

FLIGHT ENDURANCE CHALLENGE LEVEL II

OVERVIEW: Participants analyze flight principles with a rubber band powered model aircraft.

I. CONTENT PURPOSE

- A. Build, fly, and adjust (trim) a model to make long endurance flights inside a contained airspace. Any model design is acceptable if the model complies with the event specifications. All models are to be built and test flown before the event date.

II. ELIGIBILITY

- A. Entries are limited to two (2) individuals per chapter.

III. TIMELIMITS

- A. Entries must be started and completed during the current school year.
- B. Participants are provided a minimum of thirty (30) minutes for trim flights at the event site.

IV. ATTIRE

- A. Business Casual dress as described in Competitive Events Attire is the minimum requirement.

V. PROCEDURE

- A. Participants report to the event coordinator at the time and place stated in the conference program.
- B. Participants then proceed to the flying site for trim flying. Models are evaluated for specification compliance during the trim session. Time allotted for the trim portion may be extended according to the number of participants and site scheduling.
- C. Participants have two (2) opportunities to fly their models for official times. The times posted during the time trials are used to determine the sixteen (16) top combined times.
- D. Participants attend a pilot's meeting to review the sequence for making the official flights.
- E. In an orderly fashion, participants wind their models and proceed to a group timer for permission to fly.
- F. Participants place their models on the floor and wait for the signal to release from the timer. Timing begins when the model rises off the ground.
- G. Flight time ends when models hit the floor/ground or when they come to rest on an obstruction.
- H. No repairs are allowed after time trials begin.
- I. Each participant has the times of two (2) official flights recorded by the timer.
- J. Following the second flight, the sixteen (16) top combined times' models are placed on their notebooks for the next step in evaluation.
- K. Notebooks and boxes of the sixteen (16) finalists are reviewed for discrepancies or infractions.
- L. Ties are broken by determining the longest single flight time.

VI. REGULATIONS

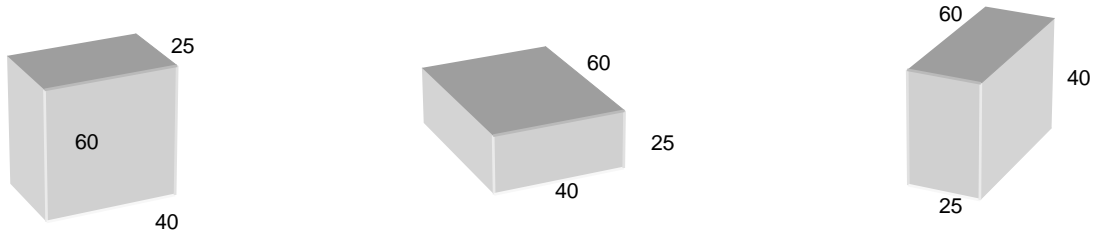
- A. All documentation must be computer-generated on 8½ " x 11" paper and contained in a notebook (a standard three-ring binder). Each notebook must include a flight log (see official sample below) with the previous ten (10) flights signed off by the participant's advisor and a written report organized to explain these specific points:
 - 1. The technical attributes of the design and a description and identification of parts.
 - 2. The modifications and an explanation of why each was developed.
 - 3. A technical review of the flight log that explains the trim adjustments and

modifications required to improve endurance. Experts from the Academy of Model Aeronautics (AMA) and the National Free Flight Society (NFFS) may scrutinize this information for validity.

Flight Log

Member Name:			Dates:		
Flight #	# of winds	Time Aloft	Flight Pattern	Trim Adjustment	Advisor Sign off
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

- B. The aircraft and its parts must be contained in a flight box that does not exceed 25cm x 40cm x 60cm.



- C. Materials include the following:

1. Models are to be made of wood and tissue paper for fuselage and flying surfaces (wings, fin and stabilizer). No plastic foams, films, or condenser paper are allowed.
2. Models use a commercially available plastic propeller or propeller assembly: minimum of 140mm to a maximum of 170mm in diameter. Trimming or thinning propellers is allowed to achieve balance and/or to reduce weight.
3. Fuselage dimension: minimum of 300mm in length measured with prop assembly attached.
4. Wingspan: maximum of 50cm horizontally projected, wing chord 12cm projected. The flight box is required and is intended to protect the plane in transit.
5. Rubber motor: maximum weight of motor is one (1) gram. No length measurement is made. Spare motors are allowed during the official flights. Black rubber O-rings of 4mm id (maximum dim) may be used on the rubber motor loop, one at the prop hook end and one at the motor hook end for easier handling of wound motors.
6. Model weight: minimum of 8 grams, maximum of 22 grams. Models are weighed with motors attached. Clay is permitted for trim ballast. (Model is weighed with clay ballast.)
7. Steel wire may be used only for propeller shaft, motor hook, and landing

- gear.
- 8. The two wheels must be a minimum of 15mm in diameter of plastic or wood and they must roll.
- D. Acceptable flight support equipment includes the following:
 - 1. Mechanical rubber motor winders (Electricity may not be available at every site.)
 - 2. A winding stooge may be used to anchor the model while its motor is being wound.
- E. The landing gear must support the airplane without sagging in its rested position.
- VII. EVALUATION
 - A. Evaluation is based on the duration of flight, written report, flight log and flight box. A bonus of ten (10) seconds is added to the flight time per flight if the airplane successfully lands on its wheels and comes to a rest setting on its wheels.
- VIII. CRITERIA FOR JUDGING
 - A. Flight One. Distance
 - B. Flight Two Distance
 - C. Landing Bonus..... 10 sec/Flight
 - D. Notebook 1.01 for no flight log or 1.20 for best accurate report
 - E. Neatness of Work 10 points
 - F. Total..... (notebook factor X flight total)
 - G. Rules Violation..... Minus 20 points

NOTES

The Academy of Model Aeronautics (AMA) welcomes your inquiries and may have suggestions and technical information that may further your knowledge and interest in model aircraft. Here's how to contact them:

AMA
 5161 E. Memorial
 Muncie, Indiana 47302
 phone 765.287.1256 (Education Department)
 fax 765.289.4248
www.modelaircraft.org
www.webwings.org

The National Free Flight Society (NFFS) is another organization that offers help to individuals who seek information concerning model building and flight technology. Learn more on the web at www.freeflight.org.